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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/736,432	12/15/2003	Alpaslan Demir	I-2-0537.1US	3424

24374 7590 08/31/2006

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EXAMINER

NGUYEN, DUC M

ART UNIT	PAPER NUMBER
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2618

DATE MAILED: 08/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/736,432

**Applicant(s)**

DEMIR ET AL.

**Examiner**

Duc M. Nguyen

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                                                                              |                                                                                        |
|----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                                                  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                                         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>3/23/05</u> . | 6) <input type="checkbox"/> Other: ____                                                |

## DETAILED ACTION

### *Information Disclosure Statement*

1. The references listed in the information disclosure statements submitted on 3/23/05 has been considered by the examiner (see attached PTO-1449).

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims **1, 10, 28** are rejected under 35 U.S.C. 102(b) as being anticipated by **Heck** (US Pat. Number **5,898,912**).

Regarding claims **1, 10**, **Heck** discloses a communication system (see Fig. 3), comprising:

(a) an automatic gain control (AGC) circuit which receives and adjusts the gain of a communication signal, the AGC being controlled by a gain control signal (see Fig. 3 and col. 3, lines 4 – col. 4, line 9, wherein the RF amplifier 40 with AGC control would read on the “AGC circuit”); and

(b) an insertion phase variation compensation module (see ref. 400 in Fig. 3) which continuously counteracts the effects of phase offsets introduced into the communication signal by the AGC circuit, based on the gain control signal (see col. 3, lines 28-31, 50-60 and col. 4, lines 1-9).

Regarding claim **28**, the claim is rejected for the same reason as set forth in claim 1 above, wherein it is clear that **Heck** would disclose steps (a) through (e) as claimed (see col. 3, line 50 – col. 4, line 9).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims **2-7, 11-16, 19-25, 29** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Heck** in view of **Riordan** (US Patent Number **6,240,100**).

Regarding claims **2, 11**, **Heck** discloses all the claimed limitations, see claims 1 above, except for an analog-to-digital converter ADC for the receiver. However, it would have been obvious to one skilled in the art to incorporate the ADC as disclosed by **Riordan** (see Fig. 3, ref. 46, 48) to the receiver circuit in **Heck** as well, so that the processing circuit 50 can be implemented with a digital processor, for utilizing advantages of a digitized processor such as cost, light weight. Also note for the similarity between the two references, i.e, both utilizing an AGC for a closed loop DC offset compensation.

In the alternative way, **Riordan** would disclose all the claimed limitations, see Fig. 3, except for clearly disclosing an insertion phase variation compensation module.

However, it is noted that by combining references 54, 58, 82, 84, 20 in Fig. 3 to a single component similar to the offset compensation circuit 400 in Fig. 3 of Heck. The claimed limitation regarding the "insertion phase variation compensation module" is made obvious by Riordan and Heck.

Regarding claims **3, 12, Riordan-Heck** as modified would disclose the insertion phase variation compensation module receives the digital I and Q signal components from the ADC and outputs altered I and Q signal components having different phase characteristics than the digital I and Q components (see Riordan, compensated I-Q output 58, 60 in Fig. 3), the communication system further comprising a modem which receives the altered I and Q signal components, the modem including a processor which generates the gain control signal (see Riordan, AGC controller 72).

Regarding claims **4, 13, Riordan-Heck** as modified would disclose the processor calculates how much power is input to the ADC (see Riordan, col. 5, lines 57-58).

Regarding claims **5, 14, Riordan-Heck** as modified would disclose the insertion phase variation compensation module receives the digital I and Q components from the ADC and alters the phase characteristics of the digital I and Q components as a function of the gain control signal (see Riordan, col. 6, lines 3-9 and Heck, col. 4, lines 1-9).

Regarding claims **6, 15, Riordan-Heck** as modified would disclose a processor (see Riordan, AGC controller 72) which generates the gain control signal, and a look up table (LUT) in communication with the processor and the insertion phase variation compensation module, wherein the LUT receives the gain control signal from the

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processor and provides estimates of the phase offsets to the insertion phase variation compensation module as a function of the gain control signal (see **Riordan**, col. 6, lines 3-9 and **Heck**, col. 4, lines 1-9).

Regarding claims **19-23**, the claims are rejected for the same reason as set forth in claims 2-6 above. In addition, since the use of an IC circuit is well known in the art as disclosed by **Riordan** (see col. 4, lines 1-3), it would have been obvious to one skilled in the art to provide the IC circuit as claimed, for utilizing advantages of IC circuits such as cost, light weight.

6. Claims **7, 16, 25, 29** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Heck** in view of **Riordan** and further in view of **Nara et al** (US **6,340,883**).

Regarding claims **7, 16, 25, 29, Riordan-Heck** as modified fails to disclose the provided estimates include a Sin function and a Cos function of a phase offset,  $x$ . However, it is noted that the estimation of compensation errors that include a Sin function and a Cos function of a phase offset is well known in the art as disclosed by **Nara** (see col. 6, lines 16-28). Therefore, it would have been obvious to one skilled in the art the DC offset correction modules as disclosed by **Riordan-Heck** would obviously include a Sin function and a Cos function of a phase offset as claimed, in order to provide the estimation accurately.

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7. Claims **7-9, 16-8, 25-27, 29-31** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Heck** in view of **Riordan** and further in view of **Hayashi** (US **6,308,057**).

Regarding claims **7, 16, 25, 29, Riordan-Heck** as modified fails to disclose the provided estimates include a Sin function and a Cos function of a phase offset,  $x$ . However, **Hayashi** disclose a receiver having an I-Q offset correction without using a feedback loop (see Figs. 4-6), for providing a receiver with quick response (see col. 1, lines 49-56). Therefore, it would have been obvious to one skilled in the art at the time the invention was made to incorporating Hayashi's teaching to **Riordan-Heck** as well, to simply replace the I-Q offset correction feed back loop 400 in **Heck** with the I-Q offset correction module, Fig. 4 in **Hayashi**, thereby providing the estimates including a Sin function and a Cos function of a phase offset  $x$  as claimed, for providing a receiver with a quick response (see col. 1, lines 35-56).

Regarding claims **8-9, 17-18, 26-27, 30-31, Riordan-Heck** as modified would disclose the insertion phase variation compensation module outputs an I-Q signal components having a phase that is adjusted in accordance with the following function:  $(\cos(x) \times \text{Re}) - (\sin(x) \times \text{Im})$  and  $(\sin(x) \times \text{Re}) + (\cos(x) \times \text{Im})$  as claimed (see **Hayashi**, Fig. 4 and col. 3, line 65 – col. 4, line 6).

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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**Simmons et al** (US 6,654,593), Combined discrete automatic gain control (AGC) and DC estimation.

**Baldwin** (US 6,735,422), Calibrated DC compensation system for a wireless communication device configured in a zero IF architecture.

**Loper** (US 5,249,203), Phase and gain error control system for use in an I-Q direct conversion receiver.

9. **Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231

**or faxed to:**

(571) 273-8300 (for **formal** communications intended for entry)

(571)-273-7893 (for informal or **draft** communications).

Hand-delivered responses should be brought to Customer Service Window, Randolph Building, 401 Dulany Street, Alexandria, VA 22314.

Any inquiry concerning this communication or communications from the examiner should be directed to Duc M. Nguyen whose telephone number is (571) 272-7893, Monday-Thursday (9:00 AM - 5:00 PM).

Or to Matthew Anderson (Supervisor) whose telephone number is (571) 272-4177.

Duc M. Nguyen, P.E.

Aug 24, 2006

